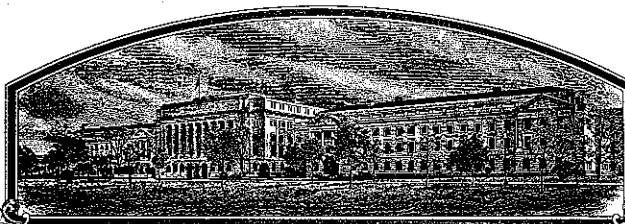


No.

200400140



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Idaho Research Foundation, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

POTATO

'Defender'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this first day of March, in the year two thousand and five.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Idaho Research Foundation, Inc. representing the interests of the entities listed under Exhibit E - Item 11		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME A90586-11		3. VARIETY NAME Defender	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) PO Box 442337 University of Idaho Moscow, ID 83844-2337 USA		5. TELEPHONE (include area code) 208-885-7173		FOR OFFICIAL USE ONLY PVPO NUMBER 2004 00 140 FILING DATE March 11, 2004	
		6. FAX (include area code) 208-885-6654			
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Non-profit		8. IF INCORPORATED, GIVE STATE OF INCORPORATION Idaho		9. DATE OF INCORPORATION 1947	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Richard C. Heimsch DL Gregory Behach <i>DRH 6/23/04</i> PO Box 442337 University of Idaho Moscow, ID 83844-2337 USA					
11. TELEPHONE (include area code) 208-885-7173		12. FAX (include area code) 208-885-6654		13. E-MAIL agres@uidaho.edu	
14. CROP KIND (Common Name) Potato		16. FAMILY NAME (Botanical) Solanaceae		18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input type="checkbox"/> NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	
15. GENUS AND SPECIES NAME OF CROP Solanum tuberosum		17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input checked="" type="checkbox"/> NO (If "no", go to item 23)	
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$3,652), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED		22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)			
25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER <i>Alison Nowakowski</i>		SIGNATURE OF OWNER			
NAME (Please print or type) Alison Nowakowski		NAME (Please print or type)			
CAPACITY OR TITLE Asst. Director, IRF, Inc.		DATE 02/26/2004		CAPACITY OR TITLE DATE	

(See reverse for instructions and information collection burden statement)

INSTRUCTIONS

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. **Retain one copy for your files.** All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvp.htm>

2004.00140

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give:
- (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 - (2) the details of subsequent stages of selection and multiplication;
 - (3) evidence of uniformity and stability; and
 - (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotope, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

SDA
6/19/2004

2004 00 140

Application for Plant Variety Protection Certificate

Exhibit A: Origin and Breeding History of the Variety

Variety: A90586-11 (~~Unnamed~~) (Defender)

Owner: Idaho Agricultural Experiment Station

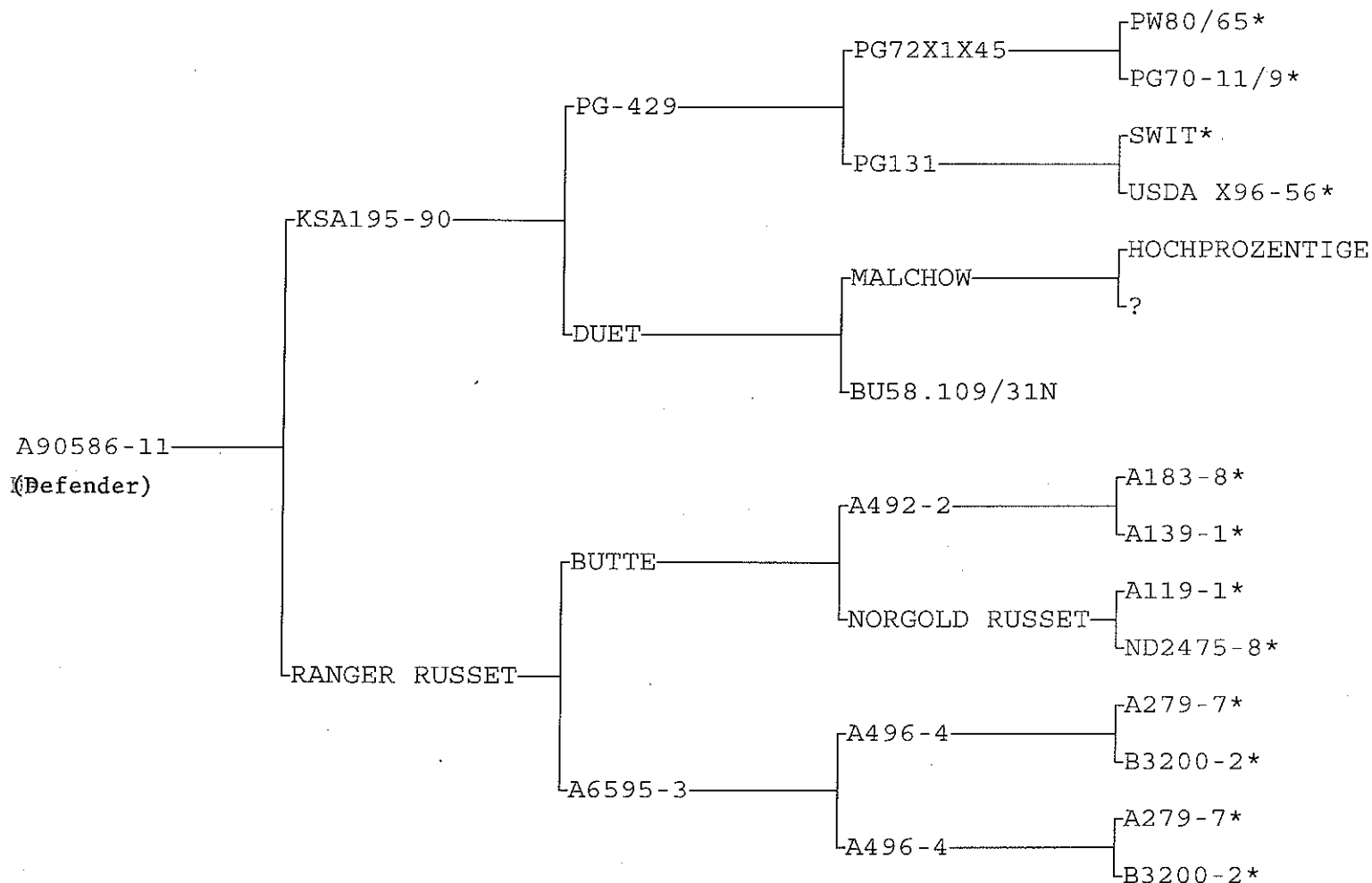
A90586-11 was derived from a sexual hybridization made at the University of Idaho's Aberdeen Research and Extension Center in 1990. It was first selected in the field in 1992 and subsequently evaluated for 11 years. In 2000-2002, A90586-11 was entered and evaluated in the Western Regional Variety Trial. A variety name for A90586-11 will be chosen in the spring of 2004. A four-generation pedigree is attached.

A90586-11 originated from a cross of KSA195-90, a breeding clone from Poland, and Ranger Russet. It was selected specifically for resistance to late blight and for use in the french fry processing market. Important selection criteria for tuber quality included specific gravity, resistance to tuber defects, and storage fry color.

A90586-11 has been clonally propagated since the first year of selection. The variety has remained ^{uniform and stable} true-to-type during all subsequent years of maintenance and propagation. It has not produced recognizable variants.

2004 00 140

CLONE: A90586-11



CLONE: A90586-11
BREEDER: PAVEK YEAR:
INSTITUTIONS:
CITATION:

TUBER TYPE: LONG
SKIN TYPE: LT SC RUSS
FLOWER COLOR: WHITE
MATURITY CLASS: LATE
YIELD CATEGORY: HIGH
USAGE CLASS: DUAL
OTHER INFORMATION:
SYNONYMS:

* PEDIGREE CONTINUES BEYOND FOURTH GENERATION IN DATABASE



Application for Plant Variety Protection Certificate

Exhibit B: Statement of Distinctness

Variety: A90586-11 (~~Unnamed~~) (Defender)

Owner: Idaho Agricultural Experiment Station

A90586-11 is distinct from Russet Burbank, the best comparative variety. The most prominent differentiating features are non-russeted tubers and resistance to both foliar and tuber late blight (Exhibit C).

In Exhibit C, other differences are documented between the two varieties. Compared with Russet Burbank, A90586-11 has less anthocyanin pigmentation on all parts of the the plant, has darker colored leaves, produces fewer flowers, produces viable pollen, has shorter tuber length, has fewer eyes on the tubers, is more resistant to PVX and corky ringspot, and is more susceptible to common scab.

OBJECTIVE DESCRIPTION OF VARIETY

POTATO (*Solanum tuberosum* L.)

NAME OF APPLICANT(S) Idaho Agricultural Experiment Station	FOR OFFICIAL USE ONLY
	PVPO NUMBER 200400140
ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) College of Agriculture University of Idaho Moscow, ID 83844	VARIETY (V) NAME XXXXXXXXXX (Defender)
	TEMPORARY OR EXPERIMENTAL DESIGNATION A90586-11

REFERENCE VARIETIES: Enter the reference variety name in the appropriate box

Reference Variety 1 (R1)	Reference Variety 2 (R2)	Reference Variety 3 (R3)	Reference Variety 4 (R4)
Russet Burbank			

1. MARKET CHARACTERISTICS:

MARKET CLASS:

1 = Yellow-flesh tablestock; 2 = Round-white tablestock; 3 = Chip-processing; 4 = Frozen-processing;
5 = Russet tablestock; 6 = Other _____

V	4	R1	4, 5	R2		R3		R4	
---	---	----	------	----	--	----	--	----	--

2. PLANT CHARACTERISTICS:

GROWTH HABIT: (See figure 1)

3 = Erect (>45° with ground); 5 = Semi-erect (30-45° with ground); 7 = Spreading.

V	5	R1	7	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

TYPE:

1 = Stem (foliage open, stems clearly visible); 2 = Intermediate; 3 = Leaf (Foliage closed, stems hardly visible)

V	2	R1	1	R2		R3		R4	
---	---	----	---	----	--	----	--	----	--

MATURITY: Days after planting (DAP) at vine senescence

V	140	R1	130	R2		R3		R4	
---	-----	----	-----	----	--	----	--	----	--

PLANTING DATE:

V	2 May 01 29 Apr 02	R1	2 May 01 29 Apr 02	R2		R3		R4	
---	-----------------------	----	-----------------------	----	--	----	--	----	--

REGION/AREA:

V	Aberdeen, ID	R1	Aberdeen, ID	R2		R3		R4	
---	--------------	----	--------------	----	--	----	--	----	--

OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C (Potato) Pa

MATURITY CLASS:

1 = Very Early (<100 DAP); 2 = Early (100-110 DAP); 3 = Mid-season (111-120 DAP); 4 = Late (121-130 DAP); 5 = Very Late (>130 DAP).

200400140

V	4
---	---

R1	4
----	---

R2	
----	--

R3	
----	--

R4	
----	--

3. STEM CHARACTERISTICS: Measure at early first bloom

STEM ANTHOCYANIN COLORATION:

1 = Absent; 3 = Weak; 5 = Medium; 7 = Strong; 9 = Very Strong

V	1
---	---

R1	2
----	---

R2	
----	--

R3	
----	--

R4	
----	--

STEM WINGS: (See figure 12)

1 = Absent; 3 = Weak; 5 = Medium; 7 = Strong; 9 = Very Strong

V	5
---	---

R1	4
----	---

R2	
----	--

R3	
----	--

R4	
----	--

4. LEAF CHARACTERISTICS:

LEAF COLOR: Observe fully developed leaves located on middle 1/3 of plant

1 = Yellowish-green; 2 = Olive-green; 3 = Medium green; 4 = Dark green; 5 = Grey-green; 6 = Other

V	4
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

LEAF COLOR: Observe fully developed leaves located on middle 1/3 of plant and circle the appropriate color chart Royal Horticulture Society Color Chart value or Munsell Color Chart value

V	147B
---	------

R1	148A
----	------

R2	
----	--

R3	
----	--

R4	
----	--

LEAF PUBESCENCE DENSITY:

1 = Absent; 2 = Sparse; 3 = Medium; 4 = Thick; 5 = Heavy

V	3
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

LEAF PUBESCENCE LENGTH:

1 = None; 2 = Short; 3 = Medium; 4 = Long; 5 = Very long

V	3
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

(Note: Descriptor #19 can be used to describe the type and length of the glandular trichomes observed.)

LEAF SILHOUETTE: (See figure 2)

1 = Closed; 3 = Medium; 5 = Open

V	3
---	---

R1	4
----	---

R2	
----	--

R3	
----	--

R4	
----	--

7

OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C (Potato) Page 5

PETIOLES ANTHOCYANIN COLORATION:

1 = Absent; 3 = Weak; 5 = Medium; 7 = Strong; 9 = Very Strong

2004 00 140

V	1
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

LEAF STIPULES SIZE: (See figure 13)

1 = Absent; 3 = Small; 5 = Medium; 7 = Large

V	6
---	---

R1	5
----	---

R2	
----	--

R3	
----	--

R4	
----	--

TERMINAL LEAFLET SHAPE: (See figure 3 & 11)

1 = Narrowly ovate; 2 = Medium ovate; 3 = Broadly ovate; 4 = Lanceolate; 5 = Elliptical; 6 = Obovate; 7 = Oblong; 8 = Other

V	2
---	---

R1	2
----	---

R2	
----	--

R3	
----	--

R4	
----	--

TERMINAL LEAFLET TIP SHAPE: (See figure 4 & 11)

1 = Acute; 2 = Cuspidate; 3 = Acuminate; 4 = Obtuse; 5 = Other

V	3
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

TERMINAL LEAFLET BASE SHAPE: (See figure 5 & 11)

1 = Cuneate; 2 = Acute; 3 = Obtuse; 4 = Cordate; 5 = Truncate; 6 = Lobed; 7 = Other

V	4
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

TERMINAL LEAFLET MARGIN WAVINESS:

1 = Absent; 2 = Slight; 3 = Weak; 4 = Medium; 5 = Strong

V	4
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

NUMBER OF PRIMARY LEAFLET PAIRS: (See figure 11)

AVERAGE:

V	4.4
---	-----

R1	3.7
----	-----

R2	
----	--

R3	
----	--

R4	
----	--

RANGE:

V	3 to 6
---	--------

R1	3 to 5
----	--------

R2	to
----	----

R3	to
----	----

R4	to
----	----

PRIMARY LEAFLET TIP SHAPE: (See figure 4 & 11)

1 = Acute; 2 = Cuspidate; 3 = Acuminate; 4 = Obtuse; 5 = Other

V	3
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

✓

OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C (Potato) Pa

PRIMARY LEAFLET SHAPE: (See figure 3 & 11)

1 = Narrowly ovate; 2 = Medium ovate; 3 = Broadly ovate; 4 = Lanceolate; 5 = Elliptic; 6 = Obovate; 7 = Oblong; 8 = Other

2004 00 140

V	2
---	---

R1	1
----	---

R2	
----	--

R3	
----	--

R4	
----	--

PRIMARY LEAFLET BASE SHAPE: (See figure 5 & 11)

1 = Cuneate; 2 = Acute; 3 = Obtuse; 4 = Cordate; 5 = Truncate; 6 = Lobed; 7 = Other

V	4
---	---

R1	4
----	---

R2	
----	--

R3	
----	--

R4	
----	--

NUMBER OF SECONDARY AND TERTIARY LEAFLET PAIRS: (See figure 11)

AVERAGE:

V	9.2
---	-----

R1	8.8
----	-----

R2	
----	--

R3	
----	--

R4	
----	--

RANGE:

V	2 to 17
---	---------

R1	3 to 14
----	---------

R2	to
----	----

R3	to
----	----

R4	to
----	----

5. INFLORESCENCE CHARACTERISTICS:

NUMBER OF INFLORESCENCE / PLANT:

AVERAGE:

V	3.5
---	-----

R1	4.9
----	-----

R2	
----	--

R3	
----	--

R4	
----	--

RANGE:

V	1 to 7
---	--------

R1	2 to 10
----	---------

R2	to
----	----

R3	to
----	----

R4	to
----	----

NUMBER OF FLORETS / INFLORESCENCE:

AVERAGE:

V	7.1
---	-----

R1	11.8
----	------

R2	
----	--

R3	
----	--

R4	
----	--

RANGE:

V	1 to 13
---	---------

R1	6 to 22
----	---------

R2	to
----	----

R3	to
----	----

R4	to
----	----

COROLLA INNER SURFACE COLOR: Measure predominant color of newly open flower and circle the appropriate color chart Royal Horticulture Society Color Chart value or Munsell Color Chart value

V	155B
---	------

R1	157A
----	------

R2	
----	--

R3	
----	--

R4	
----	--

COROLLA OUTER SURFACE COLOR: Circle the appropriate color chart

Royal Horticulture Society Color Chart value or Munsell Color Chart value

V	155A
---	------

R1	157D
----	------

R2	
----	--

R3	
----	--

R4	
----	--

OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C (Potato) Page 7

COROLLA SHAPE: (See figure 6)

1 = Very rotate; 2 = Rotate; 3 = Pentagonal; 4 = Semi-stellate; 5 = Stellate

2004 00 140

V	3
---	---

R1	4
----	---

R2	
----	--

R3	
----	--

R4	
----	--

CALYX ANTHOCYANIN COLORATION:

1 = Absent; 3 = Weak; 5 = Medium; 7 = Strong; 9 = Very strong

V	1
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

ANTHER COLOR: Measure when newly opened flower is fully expanded and circle the appropriate color chart Royal Horticulture Society Color Chart value or Munsell Color Chart value

V	17A
---	-----

R1	17A
----	-----

R2	
----	--

R3	
----	--

R4	
----	--

ANTHER SHAPE: (See figure 7)

1 = Broad cone; 2 = Narrow cone; 3 = Pear shape cone; 4 = Loose; 5 = Other

V	1
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

POLLEN PRODUCTION:

1 = None; 3 = Some; 5 = Abundant

V	3
---	---

R1	1
----	---

R2	
----	--

R3	
----	--

R4	
----	--

STIGMA SHAPE: (See figure 8)

1 = Capitate; 2 = Clavate; 3 = Bi-lobed

V	1
---	---

R1	1
----	---

R2	
----	--

R3	
----	--

R4	
----	--

STIGMA COLOR: Circle the appropriate color chart

Royal Horticulture Society Color Chart value or Munsell Color Chart value

V	144A
---	------

R1	144A
----	------

R2	
----	--

R3	
----	--

R4	
----	--

BERRY PRODUCTION: Under field conditions

1 = None; 3 = Low; 5 = Moderate; 7 = Heavy; 9 = Very heavy

V	3
---	---

R1	1
----	---

R2	
----	--

R3	
----	--

R4	
----	--

OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C (Potato) P

5. TUBER CHARACTERISTICS:

PREDOMINANT SKIN COLOR:

1 = White; 2 = Light Yellow; 3 = Yellow; 4 = Buff; 5 = Tan; 6 = Brown; 7 = Pink; 8 = Red; 9 = Purplish-red; 10 = Purple; 11 = Dark purple-black; 12 = Other_____

V	4
---	---

R1	5
----	---

R2	
----	--

R3	
----	--

R4	
----	--

GIVE COLOR CHART VALUE AND CIRCLE THE APPROPRIATE COLOR CHART

Royal Horticulture Society Color Chart value or Munsell Color Chart value

V	161A
---	------

R1	164D
----	------

R2	
----	--

R3	
----	--

R4	
----	--

SECONDARY SKIN COLOR:

1 = Absent; 2 = Present, please describe_____

V	1
---	---

R1	1
----	---

R2	
----	--

R3	
----	--

R4	
----	--

IF PRESENT, GIVE COLOR CHART VALUE AND CIRCLE THE APPROPRIATE COLOR CHART

Royal Horticulture Society Color Chart value or Munsell Color Chart value

V	
---	--

R1	
----	--

R2	
----	--

R3	
----	--

R4	
----	--

SECONDARY SKIN COLOR DISTRIBUTION: If present

1 = Eyes; 2 = Eyebrows; 3 = Splashed; 4 = Scattered; 5 = Spectacled; 6 = Stippled; 7 = Other_____

V	
---	--

R1	
----	--

R2	
----	--

R3	
----	--

R4	
----	--

SKIN TEXTURE:

1 = Smooth; 2 = Rough (flaky); 3 = Netted; 4 = Russetted; 5 = Heavily russetted; 6 = Other_____

V	1
---	---

R1	4
----	---

R2	
----	--

R3	
----	--

R4	
----	--

TUBER SHAPE: (See figure 10)

1 = Compressed; 2 = Round; 3 = Oval; 4 = Oblong; 5 = Long; 6 = Other_____

V	5
---	---

R1	5
----	---

R2	
----	--

R3	
----	--

R4	
----	--

TUBE THICKNESS:

1 = Round; 2 = Medium thick; 3 = Slightly flattened; 4 = Flattened; 5 = Other_____

V	3
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C (Potato) Page 9

TUBER LENGTH (mm):

AVERAGE:

2004 00 140

V 119

R1 131

R2

R3

R4

RANGE:

V 67 to 159

R1 92 to 178

R2 to

R3 to

R4 to

STANDARD DEVIATION:

V 15.0

R1 14.1

R2

R3

R4

AVERAGE WEIGHT OF SAMPLE TAKEN:

V 249g

R1 247g

R2

R3

R4

TUBER WIDTH (mm):

AVERAGE:

V 65

R1 64

R2

R3

R4

RANGE:

V 53 to 81

R1 50 to 80

R2 to

R3 to

R4 to

STANDARD DEVIATION:

V 5.1

R1 5.6

R2

R3

R4

AVERAGE WEIGHT OF SAMPLE TAKEN:

V 249g

R1 247g

R2

R3

R4

TUBER THICKNESS (mm):

AVERAGE:

V 57

R1 55

R2

R3

R4

RANGE:

V 45 to 70

R1 41 to 71

R2 to

R3 to

R4 to

STANDARD DEVIATION:

V 5.9

R1 5.6

R2

R3

R4

AVERAGE WEIGHT OF SAMPLE TAKEN:

V 249g

R1 247g

R2

R3

R4

TUBER EYE DEPTH:

1 = Protruding; 2 = Shallow; 3 = Intermediate; 4 = Deep; 5 = Very deep

V 2

R1 3

R2

R3

R4

OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C (Potato) Page

TUBER LATERAL EYES

1 = Protruding; 2 = Shallow; 3 = Intermediate; 4 = Deep; 5 = Very deep

2004 00 140

V	3
---	---

R1	3
----	---

R2	
----	--

R3	
----	--

R4	
----	--

NUMBER EYE / TUBER:

AVERAGE:

V	16.7
---	------

R1	24.4
----	------

R2	
----	--

R3	
----	--

R4	
----	--

RANGE:

V	8	to	27
---	---	----	----

R1	14	to	36
----	----	----	----

R2		to	
----	--	----	--

R3		to	
----	--	----	--

R4		to	
----	--	----	--

DISTRIBUTION OF TUBER EYES:

1 = Predominantly apical; 2 = Evenly distributed

V	2
---	---

R1	2
----	---

R2	
----	--

R3	
----	--

R4	
----	--

PROMINENCE OF TUBER EYEBROWS:

1 = Not prominent; 2 = Slight prominence; 3 = Medium prominence; 4 = Very prominence; 5 = Other

V	2
---	---

R1	1
----	---

R2	
----	--

R3	
----	--

R4	
----	--

PRIMARY TUBER FLESH COLOR: Circle the appropriate color chart

Royal Horticulture Society Color Chart value or Munsell Color Chart value

V	158C
---	------

R1	158B
----	------

R2	
----	--

R3	
----	--

R4	
----	--

SECONDARY TUBER FLESH COLOR:

1 = Absent; 2 = Present, please describe

V	1
---	---

R1	1
----	---

R2	
----	--

R3	
----	--

R4	
----	--

IF PRESENT, CIRCLE THE APPROPRIATE COLOR CHART:

Royal Horticulture Society Color Chart value or Munsell Color Chart value

V	
---	--

R1	
----	--

R2	
----	--

R3	
----	--

R4	
----	--

NUMBER OF TUBER / PLANT:

1 = Low (<8); 2 = Medium (8-15); 3 = High (>15)

V	1
---	---

R1	1
----	---

R2	
----	--

R3	
----	--

R4	
----	--

OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C (Potato) Page 12

9. QUALITY CHARACTERISTICS:

CHIEF MARKET:

2004 00 140

SPECIFIC GRAVITY (wt. air /wt. air - wt. water)

1 < 1.060; 2 = 1.060-1.069; 3 = 1.070-1.079; 4 = 1.080-1.089; 5 > 1.090

V 4

R1 4

R2

R3

R4

TOTAL GLYCOALKALOID CONTENT (mg. / 100 g. fresh tuber)

V 6.8

R1 4.2

R2

R3

R4

OTHER QUALITY CHARACTERISTICS: Describe any other quality characteristics that may aid in identification, (e.g. chip-processing, french fry processing, baking, boiling, after-cooking darkening). Please attach data and corresponding protocol.

11. CHEMICAL IDENTIFICATION:

Describe chemical traits of the candidate variety that aid in its identification (e.g. protein or DNA electrophoresis). Please attach data and the corresponding protocol.

12. ADDITIONAL COMMENTS AND CHARACTERISTICS:

Include any additional descriptors that would be useful in distinguishing the candidate variety.

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OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C (Potato) Page

6. DISEASES CHARACTERISTICS:

2004 00 140

DISEASES REACTION: 0 = NOT TESTED; 1 = RESISTANT; 3 = MODERATELY RESISTANT;
5 = MODERATELY SUSCEPTIBLE; 7 = SUSCEPTIBLE; 9 = HIGHLY SUSCEPTIBLE

BACTERIAL RING ROT: Foliar reaction

V	8
---	---

R1	7
----	---

R2	
----	--

R3	
----	--

R4	
----	--

BACTERIAL RING ROT: Tuber reaction

V	4
---	---

R1	5
----	---

R2	
----	--

R3	
----	--

R4	
----	--

LATE BLIGHT

V	3
---	---

R1	8
----	---

R2	
----	--

R3	
----	--

R4	
----	--

PLRV (leaf roll)

V	7
---	---

R1	7
----	---

R2	
----	--

R3	
----	--

R4	
----	--

PVX

V	2
---	---

R1	7
----	---

R2	
----	--

R3	
----	--

R4	
----	--

PVY

V	5
---	---

R1	7
----	---

R2	
----	--

R3	
----	--

R4	
----	--

OTHER: Common Scab

V	7
---	---

R1	2
----	---

R2	
----	--

R3	
----	--

R4	
----	--

OTHER: Corky Ringspot

V	2
---	---

R1	8
----	---

R2	
----	--

R3	
----	--

R4	
----	--

7. PESTS CHARACTERISTICS:

PEST REACTION: 0 = NOT TESTED; 1 = RESISTANT; 3 = MODERATELY RESISTANT;
5 = MODERATELY SUSCEPTIBLE; 7 = SUSCEPTIBLE; 9 = HIGHLY SUSCEPTIBLE

GOLDEN NEMATODE

V	0
---	---

R1	7
----	---

R2	
----	--

R3	
----	--

R4	
----	--

OTHER:

V	
---	--

R1	
----	--

R2	
----	--

R3	
----	--

R4	
----	--

8. GENE TRAITS:

INSERTION OF GENES:

☐ YES

☒ NO

If YES, describe the gene(s) introduced or attach information:

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE**EXHIBIT E**
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Idaho Research Foundation, Inc. representing the interests of the entities listed under Exhibit E - Item 11	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER A90586-11	3. VARIETY NAME XXXXXXX Defender
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) PO Box 442337 University of Idaho Moscow, ID 83844-2337 USA	5. TELEPHONE (Include area code) 208-885-7173	6. FAX (Include area code) 208-885-6654
7. PVPO NUMBER 2004 00 140		

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain. ☒ YES ☐ NO9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country. ☒ YES ☐ NO10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES ☐ NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☒ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

The Idaho Research Foundation, Inc., (representing the interests of the Washington State University Research Foundation, State of Oregon, Acting by and Through the State Board of Higher Education on behalf of Oregon State University, and United States Department of Agriculture/Agricultural Research Service.

The Idaho Research Foundation, Inc., is a partner in the Northwest (Tri-State) Potato Variety Development Program and a signatory of the General Agreement on Policy and Procedure for Release of New Publicly Developed Plant Varieties in Idaho, Oregon and Washington, between Washington State University, Oregon State University, University of Idaho and U.S. Department of Agriculture, Agricultural Research Service. In accordance with provision 2.2 of this Agreement, Idaho Research Foundation is applying for this PVPC.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.